Mississippi Space Grant Consortium
University of Mississippi
Dr. Peter C. Sukanek
(662) 915-1187
Consortium URL: http://ms.spacegrant.org//
Grant Number: NNX10AJ79H

## PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Mississippi Space Grant Consortium is a Designated Consortium funded at a level of $525,000 (base) for fiscal year 2013.

## PROGRAM GOALS

The Mississippi Space Grant Consortium (MSSGC) has three major goals for FY2013-2014 as part of the 5-year Strategic Plan developed to support NASA in pursuit of their education goals and also to detail the Mississippi Space Grant Consortium vision: The Mississippi Space Grant Consortium is a statewide network of sixteen MS Universities and Community Colleges; aerospace-related industries and public service institutions providing opportunities for Mississippians, especially those from underrepresented groups, to understand and participate in NASA's aeronautics and space program by supporting and enhancing science, technology, engineering and mathematics education, research and outreach programs. The three goals for MSSGC are:

1. **Encourage**: The Mississippi Space Grant Consortium Program will provide educational support for STEM students as well as support STEM faculty to provide hands-on activities in their classroom. Programs areas: Student support (scholarships, mentoring), Teacher training (Affiliate Workshops, Teacher Conference, Mini-Grants, K-12 Outreach (Fellowships, Hardware programs).
2. **Enhance**: The Mississippi Space Grant Consortium Program will support students in their STEM education and help provide them with the knowledge and skills needed for a world-class workforce. This support includes scholarships, fellowships, and internships with aerospace and aerospace-related industries and NASA Centers, as well as hands-on research experiences, and student rocket and balloon hardware programs. Program areas: Student support (scholarships, fellowships, student research opportunities), Internships (NASA, industry for student and community

college faculty), Research & Engineering (Hardware programs, Research Infrastructure).

3. **Enlighten**: The Mississippi Space Grant Consortium Program will nurture a scientific literate Mississippi population through minigrants for general public STEM programs and through dissemination of NASA opportunities for the informal education entities and K-12 and higher education teachers. Program areas: Community outreach (Mini-grants, Affiliate Programs); Public Relations (information dissemination, publicity, networking).

**MSSGC Objectives:**

*Specific, Measurable, Appropriate, Realistic, Timely*

**In support of Goal A "Encourage":**

**At K-12 level:**

A1. Seventy five percent of teachers participating in a MSSGC-sponsored event, such as the Teacher Workshop, will agree with the statement, "The material presented in the workshop will make me a more effective math/science teacher."

A2. Seven out of eight teachers working with MSSGC Fellows will agree with the statement, "The fellow's presence in my classroom has inspired some of my students to pursue further study in the STEM fields who may otherwise have not."

A3. On average, three new math/science teachers will graduate from MSSGC affiliate schools with MSSGC support and will accept a teaching position in Mississippi.

**At the community college/undergraduate level:**

A4. Eighty percent of undergraduate students participating in a MSSGC-sponsored program will agree with the statement, "This program has reinforced my desire to obtain a degree in math, science or engineering."

A5. On average, 12 individuals will graduate with a STEM degree from MSSGC affiliates each year with the assistance of an MSSGC program and will either enter the aerospace-related workforce or will enter a graduate program in a STEM field.

A6. Two community college faculty will incorporate new material in their course work based on their MSSGC-supported summer MSSGC workforce development experience.

A7. Seventy five percent of students participating in MSSGC-sponsored mentoring programs will agree with the statement, "Participation in this program has helped me complete my STEM degree."

**In support of Goal B "Enhance":**

B1. On average, at least two MSSGC interns will be offered full-time positions in Mississippi at a NASA-related company.

B2. Each year, eighty percent of students participating in the MSSGC intern programs will agree with the statement, "My participation in this internship position has reinforced my desire to work for NASA or a NASA-related company."

B3. At least one new significant (~ $100K/yr) contract or grant will be awarded each year to a MSSGC affiliate investigator based on work initiated with MSSGC funding.

B4. Each year, seventy five percent of the students participating in a MSSGC funded Research and Engineering program will report they are more likely to pursue or to continue to pursue a STEM career.

**In support of Goal C "Enlighten":**

C1. Seventy five percent of participants at MSSGC-sponsored educational program will agree with the statement, "The material presented in this program has increased my awareness of current science or math issues."

**General Objectives:**

D.1 Eighty percent of MSSGC affiliates will agree with the statement, "The MSSGC office has kept my campus abreast of relevant NASA and Space Grant opportunities and announcements."

D.2 All MSSGC-sponsored student awardees will reflect the demographic make-up of the State.

## PROGRAM/PROJECT BENEFIT TO OUTCOME (1, 2, OR 3)

- MSSGC FY13 (Base) funded a total of 91 students: 56 scholarships and fellowships, and 13 RI students and 22 HE students. All students are currently still enrolled at their institutions. During the summer of 2014, 8 students will be funded for internships: 3 Industry interns and 5 NASA Centers' interns. (Selections are being made at this time.) Of these 91 awards, 36 were made to underrepresented minority students (39.5%) and 39 awards to female students (42.8%). This is close to the MSSGC benchmark of 42.70% for underrepresented and over the 40% benchmark for females. These percentages will be revised once the NASA Centers' and industry internship have been selected and the USM awards reported. (IES/US Dept of Education stats: MS minority enrollment average of 42.7%: (Outcome 1)
- The MSSGC Fellowship awardees must complete a K-12 outreach component. MSSGC Fellowship program continues with excellent evaluations from K-12 teachers with the thirteen MSSGC Fellows and their K-12 outreach activities as part of the Fellowship requirement. Teachers' evaluations were complimentary of the Fellows and their added expertise aiding their curriculum in their classroom. (Outcomes 1 & 2)
- Student Data and Longitudinal Tracking: 49 students took next step in FY13 (SG participation supported from FY06-FY13 funds)
    - 15 are pursuing advanced degrees in STEM disciplines
    - 1 is seeking STEM employment
    - 3 accepted STEM positions at NASA contractors
    - 10 accepted STEM positions in industry
    - 1 accepted a STEM position in K-12 academia
    - 3 accepted STEM positions in academia
    - 16 went on to positions in non-STEM disciplines
    - n/a for 2013: all participants are still enrolled

  During the FY13 program year 15 students are pursuing advanced degrees in STEM disciplines, 1 is seeking STEM employment, 3 accepted STEM positions at NASA contractors, 10 accepted STEM positions in industry, 1 accepted a STEM position in K-12 academia, 3 accepted STEM positions in academia, and 16 went on to positions in non-STEM disciplines. The remaining students have not yet received the degree that they were pursuing while the received their Space Grant award.
- Tracking comments:
    - "This program has given me much needed exposure to research, science, and technology in a way that goes beyond the traditional classroom lecture. Because

of that impact, I have a richer educational experience that will be essential in aiding me to pursue my future career goals. (Natalie Anderson - on 03/21/13, 2012 Jackson State University/Space Grant Scholarship)

- "The Space Cowboys Rocket team has had a major impact on my experience and education as an Engineer. The team allowed for the real world application of technical writing and presentation skills taught in the undergraduate curriculum, an experience which will prove advantageous through my graduate studies. The rocket team also introduced me to several new experiences, all of which will be valuable to my development as an engineer. As the leader of the aerospike subteam I learned to generate meshes and geometries for CFD analysis is Gambit, as well as how to run those analysis using Fluent. I also learned some C program for the Arduino micro-controller, as well as how to solder and wire control boards, switches, and various other electronic components. Finally the rocket team has also introduced me to the machine shop; I am now comfortable using a lathe, mill, and band saw, as well as a variety of other tools. One of the cornerstones of the Space Cowboys team is an intensive, aggressive outreach program. Team members take a personal interest in the promotion of STEM subjects to young students and opportunities for working with kids and young adults are made abundant. Personally, I have enjoyed the outreach experience as an opportunity to learn how to present technical concepts to audiences with limited scientific background, and attention spans. In summary, the Space Cowboys Rocket Team was and will continue to be an important influence in my development as an engineer by providing new challenges requiring a diverse set of skills and a broad knowledge base. (Ian Dettwiller - on 03/21/13, 2012 MSU Higher Ed Program/Rocket Team, Diamond Concessions - Stand Leader)
- "The experience gave me the freedom to help 6-12 grade students at the most critical point in their educational development. The experience also gave me the credibility to work with middle and high schools involved in STEM in the future. It was very gratifying to assist k-12 schools without having to worry about pay. This compensation structure allows the school with the most need to get help without worrying about price. It also allows organizations/businesses with resources to give back to their community. I am well pleased with the Space Grant program and I will inquire about more opportunities to do something like this in the future. (Jonathan Rudd - on 04/02/13, 2012 MSSGC Fellowship, Sandia National Labs - Graduate student technical intern-wind energy)"

These are excellent examples of internships, fellowships, MSSGC research opportunities retaining students into the NASA "next step" and pipeline. (Outcome 1 + 2)

- MSSGC continues to fund the student-led rocket and balloon programs at MSU. <u>High Altitude Balloon Project</u>: MSU/Aerospace Dept. utilizes MSSGC funds for an on-going high altitude balloon project as a research platform. FY13 funds were used in the development of instrumentation and video techniques for use on balloons and other vehicles. <u>MSU/Rocket Program</u>: MSU also uses MSSGC FY13 funds for the University Student Launch Initiative. The "Space Cowboys" are a student rocket team that has designed and built rockets and participated in the competitive launch at NASA/Marshall and the AIAA Southeastern Region Student Conference yearly. The "Space Cowboys" K-12 outreach component: This rocket team has reached over

1,000 middle school students by a variety of programs: the rocket team conducts a middle school rocket launch challenge that engages students throughout the state. Students build and fly rockets and share their activities with all of the other participants via a website; other rocket team outreach activities included speaking to over 18 middle school schools.

- MSSGC will fund 3 RI project with base funds. (Selection in process.)(Outcome 1)
- MSSGC hosted a middle school STEM workshop for in-service teachers in collaboration with the UM Center for Mathematics and Science Education. This 2-day workshop had 65 MS middle school teachers and included sessions with the NASA Outreach Educator from NASA/Stennis. (Outcome 2)
- MSSGC funded scholarship/fellowship, higher education, K-12, General Public programs at the sixteen MSSGC affiliates. These various programs are conducted by the Campus Coordinator at the MSSGC Affiliate and are all pre-approved by the MSSGC Director. Detailed descriptions are included in the next section. (Outcome 1, 2, & 3)

## PROGRAM ACCOMPLISHMENTS

The majority of Mississippi Space Grant's educational programs include scholarships and fellowships, mentored research, Higher Education projects (Outcome 1), K-12 Teacher workshops, and mini-grants (Outcome 2) related to Space Grant program objectives. Our public service programs (Outcome 3) are performed in conjunction with our affiliates' public programs at Meridian Community College, Itawamba Community College and Pearl River Community College. All of the affiliates' educational programs, K-12 through higher education, are in alignment with state educational standards.

The distribution of NASA funds within the Mississippi Space Grant Consortium for May 4, 2013- May 5, 2014:

Total: $575,000

| | | | |
|---|---|---|---|
| Scholarships/Fellowships | 35.1% | | |
| Higher Education: | 25.0% | | |
| Research Infrastructure: | 19.3% | Informal Education: | 1.2% |
| K-12: | 7.1% | Consortium Admin: | 12.4% |

- **Outcome 1:** Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals. (Employ and Educate)
  MSSGC FY13 (Base) funded a total of 91 students: 56 scholarships and fellowships, and 13 RI students and 22 HE students. All students are currently still enrolled at their institutions. During the summer of 2014, 8 students will be funded for internships: 3 Industry interns and 5 NASA Centers' interns. (Selections are being made at this time.) Of these 91 awards, 36 were made to underrepresented minority students (39.5%) and 39 awards to female students (42.8%). This is close to the MSSGC benchmark of 42.70% for underrepresented and over the 40% benchmark for females. These percentages will be revised once the NASA Centers' and industry internship have been selected and the USM awards reported. (IES/US Dept of Education stats: MS minority enrollment average of 42.7%: (Outcome 1)
- *FY 2013 MSSGC goals 1 & 2 met; MSSGC objectives A.1, A.2, A.5, A.7, B.1, B.4 met. FY 2013 programs included:*

A. MSSGC Graduate Research Fellowship Program, B. Affiliates' Fellowship and Scholarship Programs, C. Research Infrastructure Programs, D. MSSGC Industry Internships, NASA Centers' Internships

A. MSSGC Graduate Research Fellowship Program

MSSGC awarded eight $17,000 fellowships for the 2013-14 academic year. These fellowships may be renewed for up to three years, and support graduate students enrolled at a Mississippi university pursuing any field of graduate study (Masters or Doctoral level) relevant to NASA. MSSGC Grant Fellows are also required to be a resource person to a teacher in one of their graduate institution's neighboring K-12 schools for ten hours per week. Each Fellow attended a one day training workshop at UM in August to provide guidance for K-12 instruction. The applicant also had to describe their graduate research project and how it relates to NASA interests.

FY13 MSSGC Graduate Research Fellowship Program: (MSSGC Competition)

8) Fellowships @ $17,000 each for 2013-14 awarded to:

- Andrew Stamps, MSU/ Computer Science PhD student
- Brenteria Travis, UM/Computer Science PhD student
- Emily Ledbury, MSU/Mechanical Engineering PhD student
- Thomas McIntyre, MSU/Mechanical Engineering PhD student
- Brandon Templin, MSU/Mechanical Engineering PhD student
- Keith McWilliams, MSU/Aerospace Engineering PhD student
- Christopher A. Walton, MSU/Mechanical Engineering PhD student
- Kenneth Moser, MSU/Electrical and Computer Engineering PhD student

B. Affiliates' Fellowship and Scholarship Programs:

- Alcorn State University

Scholarship: ASU funded ten scholarships to support graduate and undergraduate science majors by awarding fellowships and scholarships for tuition and school expenses. Students were given the opportunity to gain research experiences: they were placed in the laboratory under the supervision of a faculty mentor. The faculty mentor gave the students basic instruction and guidance in scientific research. Students awarded scholarships were assigned to a lab that they help manage under the supervision of a professor, and they work directly under a professor as a research assistant.

- Jackson State University

Scholarships/Fellowships**:** JSU funded five scholarships. Awardees were required to meet with their faculty mentor at least 10 hours a week and conduct research as assigned by their mentor.

- Mississippi Delta Community College

Scholarships: Two students were funded to serve as math and science tutors for 2 hours a week for fall and spring semesters in the Center of Learning on campus. Tutoring is free to any MDCC students and is provided in conjunction with the MDCC Center of Learning.

- Mississippi State University

Fellowship: MSU awarded thirteen scholarships in Aerospace Engineering, Rocket Team leaders and Astronautics.

- Mississippi University for Women

Scholarship: Three scholarships were funded, after being selected by a STEM committee. The Awardee is required to pursue research at MUW or a host institution and

submit a final report of their summer work and give oral presentation at appropriate scientific meetings.

- Northwest Mississippi Community College

Scholarship: One scholarship awardee was selected by NMCC STEM faculty. The awardee assists those in need of support outside the classroom in the areas of science and math.

- University of Southern Mississippi

Scholarship**:** USM funds ten scholarships for physics, mathematics or Computer Science students. The students are selected by faculty from these three areas.

C. Research Infrastructure Programs

1. MSSGC Research Infrastructure Program: three projects will be funded with FY13, 14 and 15 funds; award process is in progress.

2. Affiliates' Research Infrastructure Programs

- Delta State University

Research Infrastructure: Funds were provided for students to assist DSU faculty in research activities and for presentation expenses at scientific/scholarly meetings.

- Jackson State University

Research Infrastructure: Funds were provided for the research component of the scholarship/fellowship research projects. Some of this amount was used to partially fund travel to scientific meetings to present project papers.

- Mississippi State University

Research Infrastructure: MSU has funded two research infrastructure projects: Transportation Technologies (including rocket propulsion, ground vehicle design and other transportation technologies) and Biomechanics and Impacts. Each project provides a stipend for the undergraduate and graduate students working on their research as well as travel funds to present their projects at scientific meetings.

- The University of Mississippi

Research Infrastructure: 3 Research Projects are currently being funded:

1. "RTIL-Membranes for Dehumidification of Gases-Mass Transport and Casting Dynamics for High Fluxing Liquid Membranes."(Chemical Engineering)
2. "Lysosomal Dysfunction May Cause or Exacerbate Atrophy on a Cellular Level under Weightlessness Conditions." (Electrical Engineering and Pharmacology)
3. "A New Generation of Composites for Aerospace Applications: POSS-Functionalized Graphene/Polyurea Nanocomposites." (Chemical Engineering and Civil Engineering.)

- Mississippi University for Women

Research Infrastructure: MUW funds two faculty research projects and results of the research projects are presented and/or published at professional conferences.

- University of Southern Mississippi

Research Infrastructure: USM funded 5 undergraduate students to work and train on methods of scientific and engineering modeling, simulation, and visualization. The High Performance Visualization Lab at USM was created through the collaborative efforts and funding of the US Navy, US Army and several academic units from the College of Science and Technology. This project was designed to create and maintain a basic knowledge foundation in the lab. This foundation is realized through training a pipeline of graduate and undergraduate students on the basics of modeling, simulation, and

scientific and engineering visualization methods and techniques. Additionally, the program is aimed to motivate the creativity of the students and to encourage them to design, build, implement, and improve visualization tools that would be helpful for all researchers who are using the lab facilities. The research coordinator in the lab holds mandatory weekly meetings. In these meetings, discussions are focused on new research ideas, problems and solutions of current research projects and demonstrations of progress reports and presentations.

D. Industry and NASA Centers' Internships: Currently, in-process for selection.

**Outcome 2:** Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty. (Educate and Engage)
*FY2013 MSSGC Goals 1 &2 met; MSSGC objectives A.1, and A.2 met;*
*FY2013 Programs included:*
MSSGC Programs: (K-12)
1. MSSGC Annual MSSGC Teachers Conference The workshop was held January 10 + 11, 2014 at the University of MS. Over 65 middle school teachers (over fifty percent are underrepresented minority teachers) attended, with speakers from the Consortium and its partners presenting topics in mathematics and science. Steve Culivan, NASA Educator, presented two sessions on space science and NASA's vision for the future. Evaluation of each speaker as well as the entire workshop was conducted. Overall, this workshop was evaluated as excellent by participants.
2. Affiliate Programs/ Higher Education and K-12/Space Grant funds**:**

- Delta State University

Higher Education: DSU funded two DSU faculty to attend workshops and/or professional development seminars designed to enhance their teaching skills or to gain current information on an emerging science or technology.

- Hinds Community College

Higher Ed/K-12: HCC awarded (2) undergraduate students to serve as mentors for former and newly recruited participants in the Minority Science and Engineering Improvement Program. These students work closely with mathematics, science, and/or computer science instructors as project/classroom/laboratory assistants. The student mentors provide career choice information, tutoring and assistance with special assignments including science projects.

- Coahoma Community College

Higher Education: CCC funded 3 students who mentor and tutor other CCC students in math, science and/or computer science.

- Itawamba Community College

Higher Education: ICC funded a student assistant to support science faculty in the development of videos, software, and on-line instructional materials. The student assistant also serves as a tutor for science students needing assistance.

- Jackson State University

K-12: Funds were provided for a summer workshop for K-12 teachers in the Jackson area. JSU sponsored a three day workshop for K-12 teachers from the Jackson Public School District. K-12 teachers learned how to conduct scientific experiments, collect, gather, and analyze experimental data and write laboratory reports.

- Meridian Community College

Higher Education: MCC funded a mentoring program, providing a stipend for a computer lab assistant. The student is available for MCC students who need tutoring in the areas of biology and chemistry.

- Mississippi Delta Community College

K-12: MDCC funded a summer workshop for area K-12 science and math teachers. Topics covered included: lab safety, science career paths, and student presentations. The seminar also included sessions to discuss "best practices."

- Mississippi Gulf Coast Community College

Higher Education: MGCCC funded students involved in the cooperative internship with the Gulf Coast Research Laboratory working with an instructor and a student centered project.

- Mississippi State University

MSSGC continues to fund the student-led rocket and balloon programs at MSU as described in the Higher Education Section. The K-12 outreach activities are also outlined: MSSGC funds and MSU Space Grant scholars are also supporting high altitude balloon flights by two MS middle schools. MSU/Rocket Program: The "Space Cowboys" K-12 outreach component: This rocket team has reached over 1,000 middle school students by a variety of programs. The rocket team conducted a middle school rocket launch challenge that engages students throughout the state. Students build and fly rockets and share their activities with all of the other participants via a website. Other rocket team outreach activities included presentations and hands-on demonstrations to over 18 middle schools. The team returned from the 2012-2013 NASA USLI with a fifth place overall finish, out of 40 other colleges and universities (MIT, CalPoly, Georgia Tech, Virginia Tech, among others). The team won first place for their documentation and reporting. The team also received an honorable mention for their 2012-2013 educational engagement activities where they reached 2000 students (elementary - high school).

Additional MSU Space Grant/K-12 projects: MSU funds tours of the MSU engineering laboratories for approximately 200 high school students. Hands-on activities are included on these tours. Most of these high school students are underrepresented minorities. MSU also funded a summer program called "LeaderSTATE." This workshop was conducted for four full weeks in June 2013, in partnership with the MSU Division of Student Affairs and the U.S. Army. Each week a group of approximately 60 high school students and 4 high school teachers attended a STEM focused residence camp at the MSU. The unifying theme for the STEM activities was space flight. Space Grant funds were used for teaching supplies and student assistant stipends. Space Grant stipend recipients taught classes, directed lab work and gave high-power rocketry demonstrations.

- Mississippi University for Women

Higher Education: MUW funded STEM faculty to accompany selected sophomores, juniors, and seniors (based on GPA) to the Mississippi Academy of Science annual meeting and the Mathematical Association of America Louisiana/Mississippi sectional meeting. The intention is to encourage MUW's stronger students to consider graduate and research careers as well as present research papers.

- Mississippi Valley State University

Higher Education: MVSU provided funds for four students and two faculty member to conduct research on student achievement in the local schools in Leflore County (95% underrepresented minorities) and to establish baseline data for placement of MVSU students in college mathematics courses.

- Pearl River Community College

Higher Education**:** PRCC funded a collaborative project with the Alpha Omega Science Club and for all students at PRCC, speakers for science lectures and conference presentations. K-12: PRCC/SG provided funds for the MCTM/PRCC Mathematics Competition held annually on campus. Also, PRCC/SG funded two area high school science teachers to attend NASA workshops.

- University of Southern Mississippi

Higher Education**:** USM funded a spring "Innovative Computing Solution Competition." Students are encouraged to contact local businesses, medical and industrial communities for projects. This goal is to encourage students and motivate their innovation in developing computer solutions and programs in the working environment. Presentations are judged by the School of Computing Faculty.

**Outcome 3:** Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission. (Engage and Inspire)

*FY 2013 MSSGC goal 3 met; MSSGC objectives C.1 & D.1 met. FY 2013 programs included:*

- MSSGC Administrative Office:

Increasing the dissemination of NASA and Space Grant activities and information is a continuing focus for the consortium's central office. Eric Day, on contract with the National Space Grant Foundation, serves as the MSSGC Webmaster. The task of dissemination is currently achieved through a variety of mechanisms including email distribution lists, a World Wide Web page, and mailings. NASA announcements and opportunities, as well as other announcements applicable to our shared NASA/consortium goals, are routinely distributed via our email lists and Web page. The consortium's Web site at http://www.ms.spacegrant.org is updated bi-monthly with consortium information, funding opportunities, conference and workshop announcements, and educational links, as well as numerous other links to science, math, and engineering information.

- Itawamba Community College and Meridian Community College

General Public: ICC and MCC each funded a "Backyard Astronomy Program" presented by the Rainwater Observatory and Planetarium scheduled for the ICC and MCC campus April, 2014. The programs are opened to the public and included advertising, and evaluating the event.

- Pearl River Community College

General Public/ Higher Education**:** PRCC/SG in collaboration with the Alpha Omega Science Club provided speaker stipends for guest scientific lecturers. The collaboration hosts several lectures by scientists in different areas whose expertise capture the interest of the student population and expand their horizons. It gives science majors the opportunity to hear from current, informed leaders in their own fields of study; non-science majors are able to relate developments in science and technology to their own

disciplines. The general public is also invited to the lecture series.

## PROGRAM CONTRIBUTIONS TO PART MEASURES

- Student Data and Longitudinal Tracking:

MSSGC FY13 (Base) funded a total of 91 students: 56 scholarships and fellowships, and 13 RI students and 22 HE students. All students are currently still enrolled at their institutions. During the summer of 2014, 8 students will be funded for internships: 3 Industry interns and 5 NASA Centers' interns. (Selections are being made at this time.) Of these 91 awards, 36 were made to underrepresented minority students (39.5%) and 39 awards to female students (42.8%). This is close to the MSSGC benchmark of 42.70% for underrepresented but over the 40% benchmark for females. These percentages will be revised once the NASA Centers' and industry internship have been selected and the USM awards reported. (IES/US Dept of Education stats: MS minority enrollment average of 42.7%: (Outcome 1)

- Percentage of students whom have taken their next step and have been successfully tracked though their next step vs. last year of MSSSG support.
  - 83% for 2006
  - 92% for 2007
  - 63% for 2008
  - 73% for 2009
  - 87% for 2010
  - 91% for 2011
  - 100% for 2012
  - n/a for 2013 – all participants sill enrolled

- Diversity:

(For Diversity discussion of institutions, faculty, and student participants; see below NASA Education priorities section below.) Diversity is a priority of the MSSGC and a topic on agendas for the Campus Coordinators Meetings. MSSGC reviews yearly stats for funded students, RI Faculty awarded and participation of the state's HBCUs. All student diversity percentages are discussed in this report in an earlier section and once complete will be reviewed at our semi-annual meeting.

- Minority-Serving Institutions Collaborations:

All five public Mississippi HBCU's are an active part of the MSSGC. (See Outcomes 1, 2, 3 for descriptions of HBCU's activities.) MSSGC has also partnered with the two private Mississippi HBCU's in the state, Rust College and Tougaloo College. (Both have been recipients of RI awards in prior years.)

- NASA Education Priorities:
  - Authentic, hands-on student experiences: MSU Rocket Program and the High Altitude Balloon Project. Both projects are described in detail in the Outcome 2 section, under Mississippi State University. In addition, students involved with the Research Infrastructure projects are all involved in hands-on research in a variety of STEM areas.
  - Engage Middle School teachers in hands-on curriculum enhancement capabilities through exposure to NASA scientific and technical expertise: The MSSGC Teacher Conference is held each year in January for 2 days, for math and science middle school teachers. Steve Culivan, Aerospace Education Specialist from

NASA/Stennis presented for the science sessions for the first day. Over 65 MS science and math middle school teachers attended this year. MSSGC partnered with UM/Center for Math and Science Education to host this Conference.

- Summer opportunities: MSU also funded a summer program called "LeaderSTATE." This workshop was conducted for four full weeks in June 2013, in partnership with the MSU Division of Student Affairs and the U.S. Army. Each week a group of approximately 60 high school students and 4 high school teachers attended a STEM focused residence camp at the MSU. The unifying theme for the STEM activities was space flight. Space Grant funds were used for teaching supplies and student assistant stipends. Space Grant stipend recipients taught classes, directed lab work and gave high-power rocketry demonstrations.
- Community Colleges: MS Community Colleges are an integral part of the MSSGC. They represent eight of the fifteen affiliates and are an active component of the Consortium.
- Aeronautics research: MSU/AE Department continues research in a RI project funded last year.
- Environmental Science and Global Climate Change: No awards for this topic were funded (or received) this year.
- Diversity of institutions, faculty, and student participants: The MSSGC consists of 16 affiliates; each campus has a MSSGC Campus Coordinator. The diversity breakdown of the MSSGC Campus Coordinators is 8 males, 8 females; 5 African American, 10 Caucasian and 1 other. (This represents 50% female and 37.5% underrepresented.) All public and private HBCUs and the one public university in the state historically for women are affiliates or education partners of the MSSGC. Benchmarks for diversity for students' awards have historically been met by the MSSGC and continue to remain a priority. For student participants' diversity: See FY13 diversity percentages in the Program/Project Benefit to Outcomes section.
- Enhance the capacity of institutions to support innovative RI activities to enable early career faculty to focus their research toward NASA priorities: The MSSGC Research Infrastructure competition/call for proposals states-"preference is given to projects that are related to NASA, have a strong interdisciplinary team, include new faculty, directly involve students and involve a NASA Center or Enterprise or an aerospace-related company."

## IMPROVEMENTS MADE IN THE PAST YEAR

- Continued to increased number of MSSGC Fellowships applications.
- The team returned from the 2012-2013 NASA USLI with a fifth place overall finish, out of 40 other colleges and universities (MIT, CalPoly, Georgia Tech, Virginia Tech, among others). The team won first place for their documentation and reporting. The team also received an honorable mention for their 2012-2013 educational engagement activities where they reached 2000 students (elementary - high school).
- Continued a closer partnership with the MS Center for Mathematics and Science Education; the partnership includes the training of the MSSGC Fellows and their K-

12 component requirement and co-hosting and providing presenters for the MSSGC Teachers Conference.

## PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION*

*(Role of affiliates and partners as described in the section "Program Accomplishments.")

**Academic Affiliates**

The University of Mississippi (UM): Public PhD degree-granting research university and lead institution for the NASA Space Grant Program. Dr. Peter Sukanek is a Professor of Chemical Engineering and serves as the Director of the MSSGC and UM/MSSGC Campus Coordinator.

The University of Southern Mississippi (USM): Public PhD degree-granting research university. Dr. Patricia M. Biesiot, Interim Dean, College of Science and Technology and is the MSSGC Campus Coordinator.

Mississippi State University (MSU): Public PhD degree-granting research university. Dr. Keith Koenig is a Professor of Aerospace Engineering and the MSSGC Campus Coordinator.

Jackson State University (JSU/HBCU): Public PhD degree-granting research university. Dr. Maria Begonia is a Professor of Biology and the MSSGC Campus Coordinator.

Alcorn State University (ASU/HBCU): Public degree-granting university. Dr. Noland Boyd, Chemistry Professor is the MSSGC Campus Coordinator.

Delta State University (DSU): Public PhD degree-granting university. Dr. Charles Smithhart is a Professor in the Dept. of Biological and Physical Sciences and is the MSSGC Campus Coordinator.

Mississippi University for Women (MUW): Public degree-grant university. Dr. Joshua Hanes is a Mathematics Professor and is the MSSGC Campus Coordinator.

Mississippi Valley State University (MVSU/HBCU): Public degree-grant university. Dr. Raymond Williams is a Mathematics Professor and is the MSSGC Campus Coordinator.

Coahoma Community College (CCC/HBCU): Associate degree-granting community college. Angela Reynolds is an Instructor in the Dept of Math, Science and Computer Science and is the MSSGC Campus Coordinator.

Hinds Community College (HCC/HBCU): Associate degree-granting community college. Dr. M. Cathryne Jackson is the Chair for the Mathematics & Natural Science Division and is the MSSGC Campus Coordinator.

Itawamba Community College (ICC): Associate degree-granting community college. Dr. Betsy Chesnutt is a Physics and Engineering Instructor and the MSSGC Campus Coordinator.

Meridian Community College (MCC): Associate degree-granting community college. Dr. Angela Carraway is a Chemistry Instructor and the MSSGC Campus Coordinator.

Mississippi Delta Community College (MDCC/HBCU): Associate degree-granting community college. Amy Biles is a Physical Science Instructor and the MSSGC Campus Coordinator.

Mississippi Gulf Coast Community College (MGCCC): Associate degree-granting community college. Mr. Steve Manis is a Science Instructor and the MSSGC Campus Coordinator.

Northeast Mississippi Community College (NEMCC): Associate degree-granting community college. Mr. Patrick Eaton is the Development Officer and is the MSSGC Campus Coordinator.
Pearl River Community College (PRCC): Associate degree-granting community college. Dr. Aleta Sullivan is a Science Instructor and the MSSGC Campus Coordinator.

**Industrial Partners**

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Enterprise for Innovative Geospatial Solutions (EIGS)
Mississippi Science Teachers Association
Mississippi Educational Broadcasting
Millsaps College
Rust College (private HBCU)
Tougaloo College (private HBCU)

**The National Space Grant Office requires two annual reports, the Annual Performance Data Report (APD) and the Office of Education Performance Measurement System (OEPM) report. The former is primarily narrative and the latter data intensive. Because the reporting timeline cycles are different, data in the two reports may not necessarily agree at the time of report submission. OEPM data are used for official reporting.**